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EXAMINER	
CHENG, PETER L	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.**	**Applicant(s)**	
	10/705,473	LAMY ET AL.	
	Examiner	**Art Unit**	
	PETER L. CHENG	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 December 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-11 and 13-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-11 and 13-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 December 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. *Please note that the following page and line numbers refer to the original specification unless noted otherwise.* The use of the trademarks **Postscript™** [**page 7, line 30**], **Quark XPress™ [page 8, line 14** and **page 14, line 6** (*of the amended specification*)], **Adobe Photoshop™ [page 8, line 14; page 14, line 6**], (Adobe) **Illustrator™** [**page 8, line 14**], (Adobe) **InDesign™** [**page 8, line 15**], **Eye-One™** [**page 10, line 32; page 11, line 8; page 11, line 23**], **iQ Match™** [**page 11, line 8**], **ProfileMaker™** [**page 11, line 13**], and **SpectroMat™** [**page 11, line 16**] have been noted in this application.

All letters of a trademark should be capitalized *or a proper trademark symbol, such as ™ or © should follow the word* wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Claim Objections

2. Claim 4 is objected to because of the following informalities:

- **Line 2:** it is assumed that applicant intended to cite **spectral** instead of "**spect ral**";

3. Claim 36 is objected to because of the following informalities:

- **Lines 1 - 3:** it is assumed that the "first wherein clause" should be removed; that is, **wherein the processor being programmed to divide a color gamut into a plurality of discrete color spectral values includes** should be removed;

4. Claim 31 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. *The limitations cited in claim 31 are also cited in claim 29 from which claim 31 is dependent upon.*

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.,* 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1, 4 – 11, and 13 - 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over **CHAN [US Patent 7,046,396 B2]** in view of **RICE [US Patent 6,563,510 B1]**.

As for claim 1, CHAN teaches a method for generating a digital color standard system for the generation or reproduction of standardized colors

[CHAN provides a system “for identifying a desired ink color and a formulation for a matching ink color”; **col. 1, lines 56 - 58]**,

comprising

a[.]) providing a color gamut;

b) ~~Dividing~~ dividing ~~a~~ the color ~~spectrum~~ gamut into a plurality of discrete spectral color values ~~with predetermined gaps between at least some of the discrete spectral color values~~;

[*These limitations correspond* to a database of discrete spectral color values. CHAN teaches that a "spectrophotometer 14, color monitor 16, and viewing booth 18 are used … to create a color data base associated with a set of ink base colors"; **col. 3, lines 43 – 46**, and cites, "The database is prepared by measuring", with the spectrophotometer, "the color information for print samples prepared from the ink color base set and/or combinations thereof at difference concentrations or strengths. The database contains a sufficient number of color information points so that the computer can extrapolate, if necessary, the color information that would result from the different combinations of the ink base color set"; **col. 5, lines 38 - 45]**

~~b~~[.]c) ~~Digitizing~~ digitizing the discrete spectral color values;

[Computer databases store information as digitized, discrete values. As noted previously, CHAN teaches the use of a spectrophotometer to measure "print samples prepared from the ink color base set" which are then stored in a database**];**

and d) representing the digitized discrete spectral color values by means of at least one reflectance curve specified in regular intervals

[As noted, a spectrophotometer is used to obtain spectral color information for generating a database of color data. A spectrophotometer measures reflectance data at regular wavelength intervals. A “reflectance curve” is merely a representation of the measured data points.

In addition, CHAN teaches that the “database contains a sufficient number of color information points so that the computer can extrapolate ... the color information that would result from the different combinations of the ink base color set. In other words, the computer calculates a *synthesized spectral curve* or other color information for the ink formulation based on the color information for the different concentrations of each ink base color”; **col. 5, lines 41 – 48.**

Furthermore, CHAN teaches that a “color match” may be determined “by the comparison of the reflectance values in the visible spectrum for the desired color and the color identified by the color matching program. A least squares calculation can be done to determine the ink formulation that will have the spectral curve with the closest fit to the spectral curve of the desired color standard, where the spectral curve for the ink formulation may be extrapolated from information of measured spectral curves in the data”; **col. 6, lines 33 – 41.**

Therefore, the color data contained in the database is in the form of a reflectance, spectral curve. Reflectance curve data is typically sampled and stored at regular wavelength intervals**]**

However, CHAN *does not specifically teach*

and wherein over at least a part of the color gamut, the digitized color spectral values are substantially equidistant to each other with respect to the color gamut.

RICE teaches a paint color matching system, wherein the "paint color samples have been arranged according to the guiding principle that adjacent samples should represent equal intervals of visual color perception"; **col. 8, lines 36 – 38.**

According to RICE's system, paint color "has a finite value (lightness) range" [**col. 6, lines 31 - 32**], "has a finite hue range" **[col. 6, line 50]**, and for any given value and hue, "has a limited known chroma range"; **col. 7, line 8.**

This finite range of lightness, hue and chroma define the color gamut that is defined by the paint system.

RICE further teaches that "the samples are arranged with reference to a vertical value axis 20, with chroma varying with the radial distance from the value axis and value varying with the vertical position relative to the value axis"; **col. 8, lines 41 – 45.**

As shown in **Fig. 7,** RICE illustrates a "plurality of fixed non-overlapping contiguous portions 50 of color space"; **col. 8, lines 59 – 60.** RICE further teaches that the "portions 50 may span an equally sized range of hues" [**col. 8, lines 66 – 67**] and preferably, "the number of color space portions 50 is sufficiently high so that each portion has a perceptually uniform hue"; **col. 9, lines 5 – 7. Fig. 8** illustrates "the color space portion 50" as "a narrow curved wedge converging at the value axis 20"; **col. 9, lines 2 – 3.**

RICE further teaches a "set of paint color display cards 200" as shown in **Fig. 23**; **col. 9, line 26 – 27.** "In one dimension of the two-dimensional array, the display cards show an increasing value, while in the other dimension the display cards show an increasing chroma"; **col. 9, lines 35 – 38.** RICE continues, "Moreover, all adjacent samples represent substantially <u>equal intervals</u> of visual color perception"; **col. 9, lines 57 – 59.**

RICE, like CHAN, also teaches the use of a spectrophotometer to "scan the input reference color into the system 36"; **col. 16, lines 25 – 26.** "In one embodiment, a SpectroEye™ … is used to scan the input reference color"; **col. 16, lines 41 – 43.** It has a physical resolution of 10 nanometers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of RICE with those of CHAN so that the database containing the digital color values would not contain values which are indistinguishable from each other. This results in an efficient use of database storage space.

Regarding claim 4, CHAN further teaches the method according to claim 1, wherein

> **the discrete <u>spectral</u> color values or the digitized <u>discrete</u> spectral color values are adapted to a color recording capability of a particular color recording process or a particular color recording device.**
>
> [CHAN teaches that the "second computer" may also consider "color recording characteristics" for the type of "recording substrate", "color reproduction characteristics" for the type of "color material", and the "color appearance characteristics" for the "color reproducing process". That is, the <u>color data</u> that is stored on the "second computer" and is transmitted to the "first computer" is data which takes into account these various characteristics.
>
> CHAN cites, "It is especially preferred to include additional information relating to the <u>print substrate</u>, <u>printing equipment</u>, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, type of substrate, color of substrate, <u>print</u>

process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed, and/or type of ink or ink properties desired"; **col. 4, lines 30 – 37.**

Therefore, CHAN teaches adapting the color values to a color recording capability of a particular color recording process or a particular color recording device (i.e., a type of "print process", or "printing equipment").**]**

Regarding claim 5, CHAN further teaches the method according to claim 4, wherein

the particular color recording device is one selected from the group consisting of an ink jet printer[,] and a rotary printing press ~~and an *alternative* printing device~~.

[As noted for claim 4, CHAN cites various examples of print processes which include offset, gravure, sheet-fed, and flexographic. Both offset and flexographic are types of "rotary printing".**]**

Regarding claim 6, CHAN further teaches the method according to claim 1, wherein

at least one of the discrete spectral color values and the ~~digital~~ digitized discrete spectral color values is adapted to a particular recording substrate

[As noted for claim 4, CHAN teaches that the color values are adapted to a particular recording (or "print") substrate.

CHAN cites, "It is especially preferred to include additional information relating to the print substrate, printing equipment, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, type of substrate, color of substrate, print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed, and/or type of ink or ink properties desired"; **col. 4, lines 30 – 37].**

Regarding claim 7, CHAN further teaches the method according to claim 1, wherein **at least one of the discrete spectral color values and the ~~digital~~ digitized discrete spectral color values is adapted to a particular recording material**

[As noted for claim 4, CHAN teaches that the color values are adapted to a particular recording material (i.e., ink or colorant).

CHAN cites, "It is especially preferred to include additional information relating to the print substrate, printing equipment, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, type of substrate, color of substrate, print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed, and/or type of ink or ink properties desired"; **col. 4, lines 30 – 37].**

Regarding claim 8, CHAN further teaches a method according to claim 7, wherein

said particular recording material is one selected from the group consisting of an ink[,] and toner ~~and an alternative printing component~~

[As noted for claim 7, CHAN teaches that the recording material may be a type of ink**].**

Regarding claim 9, CHAN further teaches the method according to claim 1, wherein

particular colors of particular image areas are scanned by means of a spectral measurement device and the particular colors or the spectral color data of the particular colors are assigned to the digitized discrete spectral color values for further processing

[CHAN teaches that a "spectrophotometer 14, color monitor 16, and viewing booth 18 are used ... to create a color data base associated with a set of ink base colors"; **col. 3, lines 43 – 46,** and cites, "The database is prepared by measuring", with the spectrophotometer, "the color information for print samples prepared from the ink color base set and/or combinations thereof at difference concentrations or strengths. The database contains a sufficient number of color information points so that the computer can extrapolate, if necessary, the color information that would result from the different combinations of the ink base color set"; **col. 5, lines 38 - 45].**

Regarding claim 10, CHAN further teaches the method according to claim 1, wherein

at least one of the discrete spectral color values and the digitized <u>discrete spectral</u> color values is set in a relation to pre-defined light conditions

[CHAN teaches that the color values contained in the database may also take into account various lighting conditions. CHAN cites, "Because print color can appear different when viewed under different light sources, it is preferred to include in the database color information for the colors as they would appear under different light sources, for example in sunlight, in D65 daylight, cool white fluorescent light, and incandescent light"; **col. 6, lines 23 - 28].**

Regarding claim 11, CHAN further teaches the method according to claim 1, wherein

the appearance of at least one of a discrete spectral color value and a digitized <u>discrete spectral</u> color value on a particular recording substrate or recording device is set into a relationship to pre-defined light conditions

[As noted for claim 4, CHAN teaches adapting the color values to a color recording capability of a particular color recording process or a particular color recording device (i.e., a type of "print process", or "printing equipment").

As noted for claim 6, CHAN teaches that the color values are adapted to a particular recording substrate.

As noted for claim 10, CHAN teaches that the color values contained in the database may also take into account various lighting conditions.

Therefore, CHAN teaches that the color values contained in the database are related by a recording process (or device), recording substrate, and lighting conditions**]**.

Regarding claim 13, CHAN further teaches the method according to claim 1, wherein

~~the~~ a recording substrate~~ which is to be used~~ is ~~being~~ spectrally measured to provide a recording substrate-specific spectral color data set, and at least one of the discrete spectral color values and the digitized discrete spectral color values is adjusted according to said recording substrate-specific spectral color data set

[As noted previously, CHAN teaches "that color can vary for an ink depending upon the substrate being printed"; **col. 7, lines 53 – 54.** CHAN further teaches that the "substrate color" may also be input as "spectral data"; **col. 7, lines 65 – 66.** CHAN's system includes a spectrophotometer which may be used to obtain the spectral data of the recording substrate.

The "adjustment" to the color values corresponds to the "calculation of the formulation" which "preferably takes into account the color shift, if any, expected for the substrate being printed"; **col. 7, lines 60 - 62].**

Regarding claim 14, CHAN further teaches the method according to claim 1, wherein

at least one color of a specimen is spectrally measured and spectral color data is assigned to at least one of a matching discrete spectral color value and a matching digitized <u>discrete spectral</u> color value

[CHAN teaches that "a variety of methods for inputting the desired color" (of a specimen) "is envisioned"; **col. 4, lines 46 – 47.** However, "more accurate color matching can be obtained using a spectrophotometer"; **col. 4, lines 57 – 58.**

Furthermore, CHAN teaches that a "color match" may be determined "by the comparison of the reflectance values in the visible spectrum for the desired color and the color identified by the color matching program. A least squares calculation can be done to determine the ink formulation that will have the spectral curve with the closest fit to the spectral curve of the desired color standard, where the spectral curve for the ink formulation may be extrapolated from information of measured spectral curves in the data"; **col. 6, lines 33 – 41].**

Regarding claim 15, CHAN further teaches the method according to claim 1, wherein

the digitized discrete spectral color values are collected to provide a digital color book of at least one chromaticity

[CHAN teaches that the desired input color may be selected from a "library of colors shown on the customer's computer monitor"; **col. 4, lines 59 – 61**. Furthermore, "the colors may be shown as an array of color chips or boxes, as a continuum of colors such as a color space, or in any other suitable way"; **col. 4, line 66 – col. 5, line 1.** The "color library", when displayed as an array of color chips (as is typical in a color "swatch book"), corresponds to the "digital color book"**].**

Regarding claim 16, CHAN further teaches the method according to claim 1, *further comprising processing the digitized discrete spectral color values,* wherein

said processing includes at least one of the following processing steps:

assigning the digitized discrete spectral color values to color values of images,

transmitting at least one digitized discrete spectral color value between remote terminals,

and printing out at least one digitized discrete spectral color value

[As noted for claim 1, "processing" of the digitized color values may include the transmission of such values from the "second computer" to the "first computer", including the display of such values on a monitor.

"The second computer **10** (illustrated as the server) selects an ink formulation and transmits the color data associated with the selected formulation to the first computer **4**"; **col. 3, lines 31 – 33.**

Furthermore, a software package "converts the spectral data of a color that is input from the computer 4 or the database software 22 to the digital information that will produce the same color on the screens of monitor 6 and 16"; **col. 3, lines 52 - 55].**

Regarding claim 17, CHAN further teaches the method according to claim 1, further comprising

using a data carrier ~~for carrying~~ to carry at least one of said digitized discrete spectral color values

["The second computer 10 (illustrated as the server) selects an ink formulation and transmits the color data associated with the selected formulation to the first computer 4"; **col. 3, lines 31 – 33.**

The "data carrier" corresponds to the "second computer" (or server).**].**

As for claim 18, CHAN teaches a computer system for generating a digital color standard system for the generation or reproduction of standardized colors [CHAN provides a system "for identifying a desired ink color and a formulation for a matching ink color"; **col. 1, lines 56 - 58**], comprising a processor [**Fig. 1** "server" (or "second computer") **10**] that is programmed to

~~(i)~~ a) divide a color ~~spectrum~~ gamut into a plurality of discrete spectral color values~~ with predetermined gaps between at least some of the discrete spectral color values~~,

[This limitation corresponds to a database of discrete spectral color values. CHAN teaches that a "spectrophotometer 14, color monitor 16, and viewing booth 18 are used … to create a color data base associated with a set of ink base colors"; **col. 3, lines 43 – 46**, and cites, "The database is prepared by measuring", with the spectrophotometer, "the color information for print samples prepared from the ink color base set and/or combinations thereof at difference concentrations or strengths. The database contains a sufficient number of color information points so that the computer can extrapolate, if necessary, the color information that would result from the different combinations of the ink base color set"; **col. 5, lines 38 - 45]**

~~(ii)~~ b) digitize the discrete spectral color values

[Computer databases store information as digitized, discrete values. As noted previously, CHAN teaches the use of a spectrophotometer to measure "print

samples prepared from the ink color base set" which are then stored in a database]**,**

wherein the digitized discrete spectral color values are representable by means of at least one reflectance curve specified in regular intervals
[As noted, a spectrophotometer is used to obtain spectral color information for generating a database of color data. A spectrophotometer measures reflectance data at regular wavelength intervals. A "reflectance curve" is merely a representation of the measured data points.

In addition, CHAN teaches that the "database contains a sufficient number of color information points so that the computer can extrapolate … the color information that would result from the different combinations of the ink base color set. In other words, the computer calculates a *synthesized spectral curve* or other color information for the ink formulation based on the color information for the different concentrations of each ink base color"; **col. 5, lines 41 – 48.**

Furthermore, CHAN teaches that a "color match" may be determined "by the comparison of the reflectance values in the visible spectrum for the desired color and the color identified by the color matching program. A least squares calculation can be done to determine the ink formulation that will have the

spectral curve with the closest fit to the spectral curve of the desired color standard, where the spectral curve for the ink formulation may be extrapolated from information of measured spectral curves in the data"; **col. 6, lines 33 – 41.**

Therefore, the color data contained in the database is in the form of a reflectance, spectral curve. Reflectance curve data is typically sampled and stored at regular wavelength intervals**]**

~~and wherein over at least a part of the color gamut, the digitized discrete spectral color values are substantially equidistant to each other with respect to the color gamut~~**;**

and ~~(iii)~~ c) process the digitized discrete spectral color values.
["Processing" of the digitized color values may include the transmission of such values from the "second computer" to the "first computer", including the display of such values on a monitor.

"The second computer **10** (illustrated as the server) selects an ink formulation and transmits the color data associated with the selected formulation to the first computer **4**"; **col. 3, lines 31 – 33.**

Furthermore, a software package "converts the spectral data of a color that is input from the computer 4 or the database software 22 to the digital information that will produce the same color on the screens of monitor 6 and 16"; **col. 3, lines 52 - 55]**

However, CHAN *does not specifically teach*

and wherein over at least a part of the color gamut, the digitized discrete spectral color values are substantially equidistant to each other with respect to the color gamut

RICE teaches a paint color matching system, wherein the "paint color samples have been arranged according to the guiding principle that adjacent samples should represent equal intervals of visual color perception"; **col. 8, lines 36 – 38.**

According to RICE's system, paint color "has a finite value (lightness) range" [**col. 6, lines 31 - 32**], "has a finite hue range" [**col. 6, line 50**], and for any given value and hue, "has a limited known chroma range"; **col. 7, line 8.**

This finite range of lightness, hue and chroma define the color gamut that is defined by the paint system.

RICE further teaches that "the samples are arranged with reference to a vertical value axis 20, with chroma varying with the radial distance from the value axis and value varying with the vertical position relative to the value axis"; **col. 8, lines 41 – 45.**

As shown in **Fig. 7,** RICE illustrates a "plurality of fixed non-overlapping contiguous portions 50 of color space"; **col. 8, lines 59 – 60.** RICE further teaches that the "portions 50 may span an equally sized range of hues" [**col. 8, lines 66 – 67**] and preferably, "the number of color space portions 50 is sufficiently high so that each portion has a perceptually uniform hue"; **col. 9, lines 5 – 7. Fig. 8** illustrates "the color space portion 50" as "a narrow curved wedge converging at the value axis 20"; **col. 9, lines 2 – 3.**

RICE further teaches a "set of paint color display cards 200" as shown in **Fig. 23**; **col. 9, line 26 – 27.** "In one dimension of the two-dimensional array, the display cards show an increasing value, while in the other dimension the display cards show an increasing chroma"; **col. 9, lines 35 – 38.** RICE continues, "Moreover, all adjacent samples represent substantially <u>equal intervals</u> of visual color perception"; **col. 9, lines 57 – 59.**

RICE, like CHAN, also teaches the use of a spectrophotometer to "scan the input reference color into the system 36"; **col. 16, lines 25 – 26.** "In one embodiment, a SpectroEye™ ... is used to scan the input reference color"; **col. 16, lines 41 – 43.** It has a physical resolution of 10 nanometers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of RICE with those of CHAN so that the database containing the digital color values would not contain values which are indistinguishable from each other. This results in an efficient use of database storage space.

Regarding claim 19, CHAN further teaches the computer system according to claim 18, wherein

> **said digitized <u>discrete spectral</u> color values are stored in memory associated with the processor and are accessible through a data network**
>
> [The digitized color values are stored in a computer database. Regarding **Fig. 1**, "The server 10 uses three software packages, 12, 20 and 22"; **col. 3, lines 40 – 41.** "Software package C 22 includes a database of color information"; **col. 3, lines 56 – 57.**
>
> Both software package C and its database of color values are associated with the processor (i.e., "second computer" or server **10**).
>
> First and second computers communicate over a network. CHAN cites, as an example, the "Internet"; **col. 3, line 2].**

Regarding claim 20, CHAN further teaches the computer system according to claim 18, wherein

> **said digitized discrete spectral color values are stored in memory associated with the processor in the form of at least one digital color swatch**
>
> **[**CHAN teaches that the desired input color may be selected from a "library of colors shown on the customer's computer monitor"; **col. 4, lines 59 – 61.** Furthermore, "the colors may be shown as an array of color chips or boxes, as a continuum of colors such as a color space, or in any other suitable way"; **col. 4, line 66 – col. 5, line 1.** The "color library", when displayed as an array of color chips (as is typical in a color "swatch book"), corresponds to a book of "digital color swatches"**].**

Regarding claim 21, CHAN further teaches the computer system according to claim 18, wherein

> **color recording characteristics data of a plurality of recording substrates are stored in the memory associated with said processor and are accessible through a data network**
>
> **[**As noted for claim 4, CHAN teaches that the characteristics of recording substrates are preferably included (along with the desired input color); **col. 4, lines 30 – 39.** The processor (i.e., the "second computer" or server 10 shown in

Fig. 1) considers these additional characteristics (along with the desired input color) when performing a color match. The resulting color match, which takes into account the characteristics of the recording substrate, is made accessible through a network to the "first computer" **(Fig. 1** reference number **4)].**

Regarding claim 22, CHAN further teaches the computer system according to claim 18, wherein

the processor can be accessed in order to combine a standard digital color swatch book or digital standard color data with color recording substrate characteristics, to generate color reproduction simulation data

[As noted previously, CHAN teaches "that color can vary for an ink depending upon the substrate being printed"; **col. 7, lines 53 – 54.** CHAN further teaches that the "substrate color" may also be input as "spectral data"; **col. 7, lines 65 – 66.** CHAN's system includes a spectrophotometer which may be used to obtain the spectral data of the recording substrate.

The "combination" of the color values with the characteristics of the recording substrate corresponds to the "calculation of the formulation" which "preferably takes into account the color shift, if any, expected for the substrate being printed"; **col. 7, lines 60 - 62].**

Regarding claim 23, CHAN further teaches the computer system according to claim 18, wherein

color reproduction characteristics data for a plurality of color materials are stored in memory associated with the processor to be accessed through a data network in order to retrieve data

[As noted for claim 4, CHAN teaches that the color values are adapted to a particular recording material (i.e., ink or colorant).

CHAN cites, "It is especially preferred to include additional information relating to the print substrate, printing equipment, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, type of substrate, color of substrate, print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed, <u>and/or type of ink or ink properties desired</u>"; **col. 4, lines 30 – 37.**

The color reproduction characteristics data for the various types of ink (i.e., "color materials") is considered by the processor (i.e., "second computer") when a color match is performed and would typically be stored in a memory accessible by the processor**]**.

Regarding claim 24, CHAN further teaches the computer system according to claim 23, wherein

said plurality of color materials are selected from the group consisting of ink[,] <u>and</u> toner ~~and an alternative printing component~~

[As noted for claim 7, CHAN teaches that the recording material may be a type of ink**].**

Regarding claim 25, CHAN further teaches the computer system according to claim 18, wherein <u>at least two</u> of the following kinds of data can be accessed or combined by the processor:

digital standard color swatch book data or digital standard color data;

color recording characteristics data for recording substrates;

color reproduction characteristics data for color materials;

<u>and</u> color appearance characteristics data for ~~various~~ color reproducing processes;

in order to achieve particular color reproduction simulation data

[In addition to the "database of color information for the ink base color set" (**col. 3, lines 56 - 57**), CHAN teaches that the "second computer" may also consider "color recording characteristics" for the type of "recording substrate", "color reproduction characteristics" for the type of "color material", and the "color appearance characteristics" for the "color reproducing process".

CHAN cites, “It is especially preferred to include additional information relating to the print substrate, printing equipment, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, type of substrate, color of substrate, print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed, and/or type of ink or ink properties desired”; **col. 4, lines 30 – 37.**

CHAN teaches “that color can vary for an ink depending upon the substrate being printed”; **col. 7, lines 53 – 54**. CHAN further teaches that the “substrate color” may also be input as “spectral data”; **col. 7, lines 65 – 66**. CHAN’s system includes a spectrophotometer which may be used to obtain the spectral data of the recording substrate.

CHAN teaches the “combination” of the digital standard color data (i.e., the database) with characteristics of the recording substrate which corresponds to the “calculation of the formulation” that “preferably takes into account the color shift, if any, expected for the substrate being printed”; **col. 7, lines 60 - 62]**

Regarding claim 26, CHAN further teaches the computer system according to claim 25, wherein

said color reproducing processes include ~~various~~ at least one selected from the group consisting of printing processes, electro-photographical color copying processes and screens

[CHAN teaches a color matching system which can be applied to "offset lithography" and other processes, such as "gravure, flexography, and silk screen printing"; **col. 8, lines 25 – 29].**

Regarding claim 27, CHAN further teaches the computer system according to claim 18, wherein

color reproduction simulation data can be browsed by a remote terminal

[CHAN teaches "the color of the selected formulation can be displayed on the customer monitor for approval by the customer. In this context, the 'customer' can be the printer and/or the print buyer and/or a designer of packaging or other printed media"; **col. 6, lines 42 - 45].**

Regarding claim 28, CHAN further teaches the computer system according to claim 18, wherein

color recording characteristics data for recording substrates,

color reproduction characteristics data for color materials,

or color appearance characteristics data for ~~various~~ color reproducing processes

can be transmitted to a data carrier or device to be stored, in order to be accessible or combinable by remote terminals, to achieve particular color reproduction simulation data.

[CHAN teaches that the "second computer" may also consider "color recording characteristics" for the type of "recording substrate", "color reproduction characteristics" for the type of "color material", and the "color appearance characteristics" for the "color reproducing process". That is, the color data that is stored on the "second computer" and is transmitted to the "first computer" is data which takes into account these various characteristics.

In addition to specifying a desired input color, CHAN teaches, "It is especially preferred to include additional information relating to the print substrate, printing equipment, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, type of substrate, color of substrate, print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed, and/or type of ink or ink properties desired"; **col. 4, lines 30 – 37.**

Therefore, CHAN teaches **color recording characteristics data for recording substrates** (i.e., "type of substrate" or "color of substrate"),

color reproduction characteristics data for color materials (i.e., "type of ink or ink properties desired"),

or color appearance characteristics data for various color reproducing processes (i.e., type of "print process", "printing equipment")

can be transmitted to a data carrier (i.e., the "second computer" 10 or server shown in Fig. 1) **or device to be stored,**

in order to be accessible or combinable by remote terminals, to achieve particular color reproduction simulation data (as noted for claim 25, CHAN teaches the "combination" of the digital standard color data (i.e., from the database) with characteristics of the recording substrate which corresponds to the "calculation of the formulation" that "preferably takes into account the color shift, if any, expected for the substrate being printed"; **col. 7, lines 60 - 62)**]

As for claim 29, CHAN teaches a *data carrier* <u>system,</u> comprising:

a ~~device~~ <u>computer readable medium</u> ~~that is adapted to receive~~ <u>configured for the storage of color data thereon, and on which computer readable medium is stored</u> color data<u>,</u>

[CHAN teaches that a "second computer" or server **10** uses "three software packages" [**col. 3, lines 40 - 41**] and that "software package C **22** includes a database of color information for the ink base color set that will be used to manufacture the ink"; **col. 3, lines 56 – 58.** The "database" corresponds to the "computer-readable medium".

In use, a "remote location includes a spectrophotometer 2, a first computer (central processing unit) 4, a color monitor 6 electronically connected to the computer, and a viewing booth 8. The spectral data of a color sample of the desired color is obtained using the spectrophotometer 2. The color data for the desired color is input into the computer 4, which transmits the data to a second computer 10"; **col. 2, lines 52 – 59.** "The second computer 10 (illustrated as the server) selects an ink formulation and transmits the *color data associated with the selected formulation* to the first computer 4"; **col. 3, lines 31 – 33]**

CHAN further teaches that the "second computer" may also consider "color recording characteristics" for the type of "recording substrate", "color reproduction characteristics" for the type of "color material", and the "color appearance characteristics" for the "color reproducing process". That is, the color data that is stored on the "second computer" and is transmitted to the "first computer" is data which takes into account these various characteristics.

CHAN cites, "It is especially preferred to include additional information relating to the print substrate, printing equipment, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, type of substrate, color of substrate, print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed, and/or type of ink or ink properties desired"; **col. 4, lines 30 – 37.** Therefore, the following limitations are anticipated by CHAN.

~~that is~~ <u>the color data being one</u> selected from the group consisting of color recording characteristics data for recording substrates
[i.e., "type of substrate, color of substrate"**],**

color reproduction characteristics data for color materials
[i.e., "type of ink or ink properties desired"**],**

color appearance characteristics data for ~~various~~ color reproducing processes [i.e., type of "print process", "printing equipment"**], and combinations thereof,**

wherein ~~said~~ <u>the</u> color data is generated by:
~~(i)~~ a) providing a color gamut,

b) dividing ~~a~~ the color ~~spectrum~~ gamut into a plurality of discrete spectral color values ~~with predetermined gaps between at least some of the discrete spectral color values~~

[*These limitations correspond* to a database of discrete spectral color values. CHAN teaches that a "spectrophotometer 14, color monitor 16, and viewing booth 18 are used … to create a color data base associated with a set of ink base colors"; **col. 3, lines 43 – 46**, and cites, "The database is prepared by measuring the color information for print samples prepared from the ink color base set and/or combinations thereof at difference concentrations or strengths. The database contains a sufficient number of color information points so that the computer can extrapolate, if necessary, the color information that would result from the different combinations of the ink base color set"; **col. 5, lines 38 - 45],**

~~(ii)~~ and c) digitizing the discrete spectral color values

[Computer databases store information as digitized, discrete values. As noted previously, CHAN teaches the use of a spectrophotometer to measure "print samples prepared from the ink color base set" which are then stored in a database**],**

wherein the digitized discrete spectral color values are representable by means of at least one reflectance curve specified in regular intervals

[As noted, a spectrophotometer is used to obtain spectral color information for generating a database of color data. A spectrophotometer measures reflectance data at regular wavelength intervals. A "reflectance curve" is merely a representation of the measured data points.

In addition, CHAN teaches that the "database contains a sufficient number of color information points so that the computer can extrapolate ... the color information that would result from the different combinations of the ink base color set. In other words, the computer calculates a *synthesized spectral curve* or other color information for the ink formulation based on the color information for the different concentrations of each ink base color"; **col. 5, lines 41 – 48.**

Furthermore, CHAN teaches that a "color match" may be determined "by the comparison of the reflectance values in the visible spectrum for the desired color and the color identified by the color matching program. A least squares calculation can be done to determine the ink formulation that will have the spectral curve with the closest fit to the spectral curve of the desired color standard, where the spectral curve for the ink formulation may be extrapolated from information of measured spectral curves in the data"; **col. 6, lines 33 – 41.**

Therefore, the color data contained in the database is in the form of a reflectance, spectral curve. Reflectance curve data is typically sampled and stored at regular wavelength intervals**]**

~~***and wherein over at least a part of the color gamut, the digitized discrete spectral color values are equidistant to each other with respect to the color gamut;***~~

~~**and (iii) processing the digitized color values.**~~

However, CHAN *does not specifically teach*

and wherein over at least a part of the color gamut, the digitized discrete spectral color values are equidistant to each other with respect to the color gamut

RICE teaches a paint color matching system, wherein the "paint color samples have been arranged according to the guiding principle that adjacent samples should represent equal intervals of visual color perception"; **col. 8, lines 36 – 38.**

According to RICE's system, paint color "has a finite value (lightness) range" [**col. 6, lines 31 - 32**], "has a finite hue range" **[col. 6, line 50]**, and for any given value and hue, "has a limited known chroma range"; **col. 7, line 8.**

This finite range of lightness, hue and chroma define the color gamut that is defined by the paint system.

RICE further teaches that “the samples are arranged with reference to a vertical value axis 20, with chroma varying with the radial distance from the value axis and value varying with the vertical position relative to the value axis”; **col. 8, lines 41 – 45.**

As shown in **Fig. 7,** RICE illustrates a “plurality of fixed non-overlapping contiguous portions 50 of color space”; **col. 8, lines 59 – 60.** RICE further teaches that the “portions 50 may span an equally sized range of hues” [**col. 8, lines 66 – 67**] and preferably, “the number of color space portions 50 is sufficiently high so that each portion has a perceptually uniform hue”; **col. 9, lines 5 – 7. Fig. 8** illustrates “the color space portion 50” as “a narrow curved wedge converging at the value axis 20”; **col. 9, lines 2 – 3.**

RICE further teaches a “set of paint color display cards 200” as shown in **Fig. 23**; **col. 9, line 26 – 27.** “In one dimension of the two-dimensional array, the display cards show an increasing value, while in the other dimension the display cards show an increasing chroma”; **col. 9, lines 35 – 38.** RICE continues, “Moreover, all adjacent samples represent substantially <u>equal intervals</u> of visual color perception”; **col. 9, lines 57 – 59.**

RICE, like CHAN, also teaches the use of a spectrophotometer to "scan the input reference color into the system 36"; **col. 16, lines 25 – 26.** "In one embodiment, a SpectroEye™ … is used to scan the input reference color"; **col. 16, lines 41 – 43.** It has a physical resolution of 10 nanometers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of RICE with those of CHAN so that the database containing the digital color values would not contain values which are indistinguishable from each other. This results in an efficient use of database storage space.

Regarding claim 30, CHAN further teaches a data carrier system in accordance with claim 29, wherein

> **the computer readable medium is <u>one selected from</u> the group consisting of a CD-ROM, a DVD-carrier, and a computer server**
> **[**As noted for claim 29, CHAN teaches a "second computer" or server **10** which accesses a "database of color information"**].**

Regarding claim 31, CHAN further teaches a data carrier system in accordance with claim 29, wherein

the color data is further generated by representing the digitized discrete spectral color values by means of <u>at least one</u> reflectance curve specified in regular intervals,

wherein over <u>at least a part</u> of the color gamut, the digitized discrete color spectral values are equidistant to each other with respect to the color gamut.

As noted for claim 29, CHAN teaches generating color data by "digitizing spectral color values" by use of a spectrophotometer. Spectrophotometers, like the SpectroEye™ cited by RICE, are capable of measuring reflectance at various wavelengths in regular intervals and can produce a reflectance curve from the measurements.

Also noted for claim 29, RICE teaches dividing the paint system's gamut in "equal intervals of visual color perception".

Regarding claim 32, CHAN further teaches a data carrier system in accordance with claim 29, wherein

the digitized discrete spectral color values are processable *by a computer configured to read out* the color data from the *computer readable medium* to generate or reproduce standardized colors

[CHAN teaches that the "second computer" or server 10 "selects an ink formulation and transmits the <u>*color data*</u> *associated with the selected formulation* to the first computer 4, <u>*where the color of the selected ink formulation can be viewed on color monitor 6*</u>"; **col. 3, lines 31 – 35].**

Regarding claim 33, CHAN further teaches a method for generating a digital color standard system for the generation or reproduction of standardized colors in accordance with claim 1, wherein

the dividing step includes dividing the color gamut into a plurality of discrete spectral color values with predetermined gaps between at least some of the discrete spectral color values

[As noted for claim 1, CHAN cites, "The database is prepared by measuring", with the spectrophotometer, "the color information for print samples prepared from the ink color base set and/or combinations thereof at difference concentrations or strengths. The database contains a sufficient number of color information points so that the computer can extrapolate, if necessary, the color information that would result from the different combinations of the ink base color set"; **col. 5, lines 38 – 45.**

By the very nature of being "discrete" values, a "predetermined gap" between the "discrete spectral color values" is expected. Regardless, CHAN teaches above a database containing a plurality of discrete spectral color values with

predetermined gaps. However, since there is a "sufficient number of color information points" (i.e., discrete spectral color values), the computer can extrapolate "the color information that would result from the different combinations of the ink base color set"**]**.

Regarding claim 34, CHAN further teaches a method for generating a digital color standard system for the generation or reproduction of standardized colors in accordance with claim 1, further comprising

processing the digitized discrete color spectral values

["Processing" of the digitized color values may include the transmission of such values from the "second computer" to the "first computer", including the display of such values on a monitor.

"The second computer **10** (illustrated as the server) selects an ink formulation and <u>transmits</u> the color data associated with the selected formulation to the first computer **4**"; **col. 3, lines 31 – 33.**

Furthermore, a software package "converts the spectral data of a color that is input from the computer 4 or the <u>database</u> software 22 to the digital information that will <u>produce</u> the same color on the screens of monitor 6 and 16"; **col. 3, lines 52 - 55].**

Regarding claim 35, CHAN further teaches a computer system in accordance with claim 18, wherein

the processor is further programmed to provide the color gamut

[As noted for claim 18, the “second computer” or server may provide the “divided” and “digitized” color gamut to a “first computer” where it can be displayed on a monitor; **col. 3, lines 31 - 35].**

Regarding claim 36, CHAN further teaches a computer system in accordance with claim 18, wherein

~~**the processor being programmed to divide a color gamut into a plurality of discrete color spectral values includes wherein**~~

the processor is programmed to divide a color gamut into a plurality of discrete color spectral values with predetermined gaps between at least some of the discrete color spectral values

[As noted for claim 1, CHAN cites, “The database is prepared by measuring”, with the spectrophotometer, “the color information for print samples prepared from the ink color base set and/or combinations thereof at difference concentrations or strengths. The database contains a sufficient number of color information points so that the computer can extrapolate, if necessary, the color information that would result from the different combinations of the ink base color set”; **col. 5, lines 38 – 45.**

By the very nature of being "discrete" values, a "predetermined gap" between the "discrete spectral color values" is expected. Regardless, CHAN teaches above a database containing a plurality of discrete spectral color values with predetermined gaps. However, since there is a "sufficient number of color information points" (i.e., discrete spectral color values), the computer can extrapolate "the color information that would result from the different combinations of the ink base color set".**].**

Response to Arguments

1. Applicant's arguments filed 12/26/2007 have been fully considered but have been rendered moot in view of the amended claims.

However, with respect to applicant's "preliminary argument" that

> *RICE would appear to fail, inter alia, to teach or suggest a modification to the teachings of CHAN that would yield an apparatus for, or a method including,*
>
> *dividing a color gamut into a plurality of discrete spectral color values, and digitizing the discrete spectral color values,*

wherein the digitized discrete spectral color values are representable by means of at least one reflectance curve specified in regular intervals

and wherein over at least a part of the color gamut, the digitized discrete color spectral values are substantially equidistant to each other with respect to the color gamut

has been considered.

In reply:

As noted in the claim rejections, RICE teaches a modification to the teachings of CHAN whereby a color gamut (of CHAN's color system) is divided and digitized into discrete spectral color values by measuring color samples by use of a spectrophotometer. A spectrophotometer measures reflectance data at regular wavelength intervals. A "reflectance curve" is merely a representation of the measured data points.

In addition, RICE teaches a paint color matching system, wherein the "paint color samples have been arranged according to the guiding principle that adjacent samples should represent equal intervals of visual color perception". This principle can be interpreted as having *digitized discrete color spectral values* which are *equidistant to each other with respect to the color gamut.*

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- U.S. Patent 5,798,943 (Cook et al.)
- U.S. Patent 6,349,300 B1 (Graf et al.)
- U.S. Patent 6,842,654 B2 (Lawn et al.)
- U.K. Patent Application GB 2361158 A (Durnian and Dornan)

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter L. Cheng whose telephone number is 571-270-3007. The examiner can normally be reached on MONDAY - FRIDAY, 8:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Y. Poon can be reached on 571-272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/King Y. Poon/
Supervisory Patent Examiner, Art Unit 2625

plc
March 15, 2008